



Designation: E1975 – 09

Standard Specification for Shelter, Electrical, Equipment S-280/G¹

This standard is issued under the fixed designation E1975; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers one type of lightweight field and mobile shelter designed for transport by cargo truck, fixed or rotary winged aircraft, by rail, and ship, as Shelter, Electrical Equipment S-280/G (see 15.5).

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 The following safety hazards caveat refers only to the test methods described in this specification. *This standard does not purport to address the safety concerns, if any, associated with its use. It is the responsibility of the user of the standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- C273 Test Method for Shear Properties of Sandwich Core Materials
- D1621 Test Method for Compressive Properties of Rigid Cellular Plastics
- D1622 Test Method for Apparent Density of Rigid Cellular Plastics
- D2842 Test Method for Water Absorption of Rigid Cellular Plastics
- E864 Practice for Surface Preparation of Aluminum Alloys to Be Adhesively Bonded in Honeycomb Shelter Panels
- E1730 Specification for Rigid Foam for Use in Structural Sandwich Panel Cores
- E1749 Terminology Relating to Rigid Wall Relocatable Shelters

E1773 Practice for Sealing Rigid Wall Tactical Shelters with Polysulfide Based Sealants

E1794 Specification for Adhesive for Bonding Foam Cored Sandwich Panels (200°F Elevated Humidity Service), Type II Panels

E1801 Practice for Adhesive Bonding of Aluminum Facings in Foam and Beam Type Shelters

E1851 Test Method for Electromagnetic Shielding Effectiveness of Durable Rigid Wall Relocatable Structures

E1925 Specification for Engineering and Design Criteria for Rigid Wall Relocatable Structures

2.2 Commercial Standards:³

- SAE AMS-W-6858 Welding, Resistance: Spot and Seam
- SAE AMS-STD-1595 Qualification of Aircraft, Missile, and Aerospace Fusion Welders

2.3 Federal Air Regulation (FAR):⁴

- FAR 25.853 Compartment Interior

2.4 Military Standards:

- MIL-F-14072 Finishes for Ground Electronic Equipment⁵
- MIL-DTL-55507 Shelter, Electrical Equipment, (With or Without Equipment), Packaging of⁵
- MIL-STD-202 Electronic and Electrical Component Parts⁵
- MIL-STD-252 Wired Equipment, Classification of Visual and Mechanical Defects for Equipment, Electronic, Wired, and Other Devices⁵
- MIL-STD-810 Environmental Engineering Considerations and Laboratory Tests⁵
- MIL-STD-1916 DOD Preferred Methods for Acceptance of Product⁶
- MIL-STD-2219 Fusion Welding for Aerospace Applications⁶
- MIL-M-13231 Marking of Electronic Items⁵

¹ This specification is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.53 on Materials and Processes for Durable Rigidwall Relocatable Structures.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from AMS Publications, Society of Automotive Engineers, SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, <http://www.sae.org>.

⁴ Available from Flight Standards Service, Federal Aviation Administration (FAA), 800 Independence Ave., SW, Washington, DC 20591, <http://www.faa.gov>.

⁵ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.

⁶ Available from US Army Natick Soldier Center, ATTN: AMSRD-NSC-CP-CS, Kansas Street, Natick, MA 01760-5018.

2.5 Drawings:⁶

SC-D-36423 Hold Down Assembly
 SC-D-36424 Cable Assembly
 SC-C-200154 Keeper
 SM-D-450462 Panel Assembly, Emergency Exit
 SM-C-450466 Air Filter
 SM-C-555515 Shock Mount
 SM-B-563756 Sealer
 SC-D-595509 Cover, Emergency Exit
 SC-B-595564 Core Material-Urethane, Light
 SC-B-595565 Core Material-Urethane, Heavy
 SM-D-615264 Intake Louver Assembly
 DL-SC-A-621051 Modification Kit, Radio Frequency Interference, MK-1079/G
 SM-D-781242 Door Fixture (S-280) Construction Tightness Test
 SM-D-781243 Drain Fixture (S-280) Construction Tightness Test
 SM-D-781244 S-280 Construction Tightness Test
 DL-SM-B-947080 Shelter, Electrical Equipment S-280C/G
 SM-D-947080 Shelter, Electrical Equipment S-280C/G
 SM-D-947081 Panel Assembly, Front
 SM-D-947082 Panel Assembly, Rear
 SM-D-947083 Panel Assembly, Roof
 SM-D-947084 Panel Assembly, Floor
 SM-D-947085 Panel Assembly, Side
 SM-D-947141 Corner, Lifting Eye (Machining)
 SM-D-947142 Corner, Towing Eye (Machining)
 SM-D-947143 Casting, Lifting and Towing Eye
 SM-D-947160 Door Jamb Assembly
 SM-D-947166 Door Assembly
 SM-B-947179 Bonding Procedure
 SM-B-947180 Cleaning Procedure
 SM-D-947181 Flatness and Squareness Measurements
 SM-B-947184 Adhesive
 SM-D-947186 Test Weight Installation
 SM-C-947230 Shock Mount
 SM-D-947235 Mounting Bracket, Skid
 SM-C-947237 Shock Mount
 SM-D-947238 Skid Assembly
 17-1-3274 Shelter, Electrical Equipment, S-280C/G (Shielded)

3. Terminology

3.1 Definitions:

3.1.1 *delaminations*—for the purpose of this specification, a delamination is defined as the condition that exists within a shelter section or panel when two surfaces that once were bonded together are no longer bonded together. Delaminations may occur between any two bonded surfaces, examples include: separations between thermal barriers and members, between thermal barriers and skins, between members and core, or between skins and core. They may be the result of a poor quality bond or they could occur due to misuse or severe handling of the panels or the shelter after bonding. Test requirements of this specification shall not be construed as misuse or severe handling as these terms apply to the definition of delaminations (see 5.4).

3.1.2 *examination*—examination consists of simple, generally nondestructive determinations of compliance, without the use of special testing equipment.

3.1.3 *inspection*—inspection is the examination or testing, or both, of supplies to determine compliance with the applicable requirements. Sampling is an element of inspection.

3.1.4 *testing*—testing consists of determinations of compliance, using technical means.

3.1.5 *voids*—for the purpose of this specification, a void is defined as any unauthorized separation or space within a shelter panel or section, that is, any separation or space that is in conflict with the drawings or other contractual requirements. Voids range from gaps as wide as the space created by a missing piece of core material to as thin as a break in the continuity of material. Voids may be located solely within one type of material, such as a core material separation; they may exist between adjacent materials, such as unbonded core material; or they may be located between other parts within a panel, such as where a piece of material is missing, damaged, or undersized. Voids may have been created at the time of construction, such as where a part was omitted; or may be created at a later time, such as a core separation or delaminated skin (see 5.4).

NOTE 1—All other terminology related to this specification is defined in Terminology E1749.

4. Material Requirements

4.1 *General*—Materials used in the construction of this item shall be in accordance with the following requirements:

4.2 *Core Material*—Core material density, compressive strength, shear strength, flammability, and water absorption properties shall be in accordance with Specification E1730 and Drawings SC-B-595564 and SC-B-595565, as applicable (see 12.2.1, 10.1, Table 1, and Table 2).

4.3 *Adhesive*—The shear strength of the cured adhesive and its bond to aluminum shall be in accordance with requirements of Specification E1794 and the Drawing SM-B-947184. This requirement shall apply to the low temperature, room temperature, and high temperature conditions and after the

TABLE 1 First Article Specimens

Inspection	Quantity	Requirements Subsection	Test Subsection
Core material:		4.2	10.1
Density	5 for every grade or type	4.2	10.1.1
Compressive strength	5 for every grade or type	4.2	10.1.2
Shear strength	5 for every grade or type	4.2	10.1.3
Flammability	5 for every grade or type	4.2	10.1.4
Water absorption	3 for every grade or type of urethane	4.2	10.1.5
Adhesive	50 coupons	4.3	10.2
Sealer	50 coupons	4.4	10.2
Shock mounts	SM-C-555515: 3 per –3 SM-C-947237: 3 each SM-C-947230: 3 each	4.5	10.3.1
Impact panel	1 from wall, 1 from floor	5.4.1	10.7
Hold down assembly	1 complete	9.2	10.32
Eye casting hardness	1 casting in accordance with SM-D-947143	7.5.2	10.24.2